



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,401	10/29/2003	Tony J. Keeton	ASMEX.419A	7477

20995 7590 09/27/2006

KNOBBE MARTENS OLSON & BEAR LLP  
2040 MAIN STREET  
FOURTEENTH FLOOR  
IRVINE, CA 92614

EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

6

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/697,401	KEETON ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Rakesh K. Dhingra	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

**Continued Examination Under 37 CFR 1.114**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/17/06 has been entered.

**Response to Arguments**

Applicant's arguments with respect to claims 1-22, 27-29 have been considered but are moot in view of the new ground(s) of rejection as explained below:

Applicant has amended claims 1, 12, 18, 27 by adding new limitation "veins substantially angled with respect to radial direction". New reference by Yudovsky et al (US patent No. 6,248,176) has been found that reads on claim limitations of claims 1, 18, 27. Accordingly claims 1, 18, 27 have been rejected under 35 USC 102 (b) as explained below. Dependent claims 2, 19, 28, 29 have also been rejected under 35 USC 102 (b) as explained below.

Claim 12 has been rejected under 35 USC 103 (a) as being unpatentable over Yudovsky et al in view of Goodman as explained below.

Remaining dependent claims 3-17, 20-22 have also been rejected under 35 USC 103 (a) as explained below.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1763

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 2, 18, 19, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Yudovsky et al (US Patent No. 6,248,176).**

Regarding Claims 1, 18, 19, 27, 28: Yudovsky et al discloses an apparatus (Figs. 1-6) for processing a semiconductor substrate, comprising a substrate support member (structure) 30 configured to support a substrate 14, and a deflection member (support element) 100, wherein the deflection member 100 comprises an annular ring having plurality of grooves (veins) 106 that are substantially angled with respect to radial direction. Yudovsky et al further teach that deflection member 100 can be an integral part of support member 30. Yudovsky et al also teach that deflection member (annular veined ring) 100 can be oriented in the same horizontal plane as the upper surface 32 of the support member 30 (that is, the deflection member/annular veined ring 100 can support the outer edge of wafer 14) [Column 4, line 32 to column 7, line 65].

Regarding Claim 2: Yudovsky et al discloses that the deflection member (veined ring) 100 could have 100-200 veins. However it would be obvious to increase the number of veins (300 or more) for bigger diameter of ring for use with large dia. substrates like 300 mm or higher (column 7, lines 5-15).

Regarding Claim 29: Yudovsky et al teach that grooves (veins) 106 can be parabolic (curved) [column 7, lines 42-65].

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1763

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 3, 4, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yudovsky et al (US Patent No. 6,248,176) in view of Horiguchi et al (US PG PUB No. 2002/0007791).**

Regarding Claims 3,4: Yudovsky et al teach all limitations of the claim except a first annular groove positioned radially inward from the support element.

Horiguchi et al teach an apparatus (Figure 3) that includes a substrate support 3 with annular groove 30 (first annular groove) having uniform annular thickness, that is positioned radially inward from the support element (paragraph 0058).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use annular grooves on the top surface of substrate support as taught by Horiguchi et al et al in the apparatus of Yudovsky et al to avoid shifting or slide of wafer (paragraph 0010).

Art Unit: 1763

Regarding Claim 20: Yudovsky et al in view of Horiguchi et al discloses that apparatus comprises a plurality of annular recesses in the susceptor, wherein a first of the plurality of recesses 34 is positioned radially outward of the plurality of veins (Fig. 6 – Yudovsky et al) and a second of the plurality of recesses 30 is positioned radially inward of the plurality of veins (Fig. 3 – Horiguchi et al).

**Claims 5-11, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yudovsky et al (US Patent No. 6,248,176) in view of Horiguchi et al (US PG PUB No. 2002/0007791) as applied to Claims 3, 20 and further in view of Goodman (US PG PUB No. 2003/0198910).**

Regarding Claims 5: Yudovsky et al in view of Horiguchi et al teach all limitations of the claim except a substrate pocket and the first annular groove is lower than the surface of substrate pocket.

Goodman discloses an apparatus (Figure 1A, 3C) for semiconductor processing that includes a substrate holder 200 comprises grooved structure and has a groove G (like first annular groove) {Figure 1A}, that is positioned radially inward from the grid protrusions (like support element) 222 (Paragraph 0011). Goodman further discloses the substrate holder further comprises a substrate pocket (Fig. 3C, 4C, Item 202) and the first annular groove is formed such that the first annular groove is lower than a surface of the substrate pocket (Fig. 3C, 4C Item 222).

Yudovsky et al, Horiguchi et al and Goodman are analogous art because they are from the same field of endeavor, namely substrate holders.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide substrate pocket as taught by Horiguchi et al in the apparatus of Yudovsky et al in view of Horiguchi et al to provide proper support for the substrate.

Regarding Claim 6: Goodman discloses a second annular groove on the substrate holder, the second annular groove being positioned radially outward from the support element (Fig. 1a Item 7).

Regarding Claim 7: Goodman discloses that a vertical depth of the first annular groove is greater than a vertical depth of the second annular groove (Figs. 3C, 4 Item 222).

Regarding Claim 8: Goodman discloses an annular ring raised above the substrate pocket and positioned radially inward of the support element (Fig. 4 Item 220).

Regarding Claim 9: Goodman discloses that the substrate holder is configured to be supported by a spider structure 22 comprising a vertical shaft 24 and at least three substrate holder supporters extending radially outward and upward from the shaft, the substrate holder supporters configured to support the bottom surface of the substrate holder (Figure 2 and Paragraphs 0034, 0035).

Regarding Claim 10: Goodman discloses that the bottom surface of the substrate holder includes a recess configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3B Item 214).

Regarding Claim 11: Goodman discloses the bottom surface of the substrate holder includes a circular groove centered about a central vertical axis of the substrate holder (Fig. 3B Item 214), the circular groove configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3B Item 214), the circular groove of the bottom surface being interrupted in one location (Fig. 3B Item 216).

Regarding Claim 22: Goodman disclose an annular ring on the susceptor, the annular ring being positioned radially inward of the second of plurality of veins and having a raised surface no higher than the support plane (Goodman - Fig. 4 Item 228).

**Claim 12-17, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yudovsky et al (US Patent No. 6,248,176) in view of Goodman (US PG PUB No. 2003/0198910).**

Regarding Claim 12: Yudovsky et al teach all limitations of the claim as explained above except plurality of heating elements configured to heat the reaction chamber.

Goodman teaches an apparatus (Figures 1A, 2) for processing a substrate, comprising: a reaction chamber (Goodman - Fig. 2 Item 12); a plurality of radiant heating elements configured to heat the reaction chamber (Goodman - Fig. 2 Item 14); and a substrate holder in the reaction chamber (Fig. 2 Item 20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use plurality of heating lamps for heating the reaction chamber as taught by Goodman in the apparatus of Yudovsky et al to provide heating of the chamber (as per process limitations).

Regarding Claim 13: Yudovsky et al in view of Goodman discloses that the substrate holder further comprises a substrate pocket (Fig. 4 Item 202, Goodman), and an annular groove formed in the substrate pocket and configured to surround an outer edge of the substrate (Fig. 4 Item 204, Goodman) when the substrate is supported on the plurality of support elements 106 (grooves) [Yudovsky et al, Figures 3, 6].

Regarding Claim 14: Yudovsky et al discloses that the support plane is formed by top surfaces of the substrate support 30 and plurality of spaced veins 106 (Yudovsky et al – Figures 1-6).

Regarding Claim 15: Goodman discloses (as explained above) that apparatus further comprises an annular recess in the substrate pocket, the annular recess positioned radially inward of the support elements (Fig. 5 Item 222).

Regarding Claim 16: Goodman discloses a support structure configured to support the substrate holder, the support structure comprising a vertical shaft and a plurality of support arms extending generally radially outward and upward from the shaft, the support arms having upper ends configured to support the substrate holder (Fig. 2 Items 22, 24).

Regarding Claim 17: Goodman discloses that apparatus comprises an annular ring on the substrate holder, the annular ring being positioned radially inward of the support elements and having a



Art Unit: 1763

raised surface higher than a surface of the substrate pocket but no higher than the support plane (Fig. 4 Item 220).

Regarding Claim 21: Goodman discloses that apparatus further comprises an annular ring on the susceptor, wherein the annular ring being positioned radially inward of the plurality of recesses and having a raised surface no higher than the support plane (Fig. 4 Item 220).


### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Rakesh Dhingra

  
Parviz Hassanzadeh  
Supervisory Patent Examiner  
Art Unit 1763